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Exploring the Effect of Organisational Variables on Employee Environmental Behaviour

Introduction: While the environmental behaviour of individuals, families and households have been studied extensively in the academic literature, the environmental behaviour of employees, and the use of social marketing campaigns and interventions delivered during working hours has been studied very little (Lo et al 2012a). However this type of behaviour is extremely important for a reduction in levels of carbon produced by organisations and Pérez-Lombard et al (2008) note that energy consumption from buildings is an increasing concern, fuelled by a growth in the population, an increase in demand for comfort levels, and the rise in time spent inside buildings. They note that office buildings within the commercial and retail sectors account for 17% of UK energy consumption and 2% of total energy use. Within offices, 55% of energy consumption is through heating, ventilation and air-conditioning (HVAC), 17% from lighting and the rest from equipment, food preparation and refrigeration etc.

Early studies in this area have been directly taken from or compared with household environmental behaviour but there are considerable differences to consider with regards to motivation for and issues surrounding employees' environmental behaviour. Employees do not generally have a financial interest in the workplace, no energy bills mean that individuals are not always concerned with their energy usage, they have little context for how much they have used relative to previous periods, and devices are often shared so individuals may feel the problem is out of their hands (Siero et al 1996; Carrico and Riemer 2011). However Carrico and Riemer (2011) note positively that employees are a more captive audience and can be targeted through low costs means, already in place, such as e-mails and newsletters.

Past research on employee environmental behaviour has focused on two factors: individual and organisational factors. However, the majority of the work has explored individual factors (see below) and thus, a wider range of variables, including organisational variables, should be explored. An attempt to link organisational and individual variables could provide a better understanding of employee environmental behaviour (Lo et al 2012a) as there is a clear crossover in the literature between organisational and individual/behaviour variables, since organisational factors can affect motivation, attitudes and determine aspects of feedback, support and infrastructure. Therefore, the focus of this paper is organisational factors. Data from four organisations were analysed. A first analysis explores correlations between organisational and individual variables and a second analysis explores the impact of a social marketing intervention on organisational and behaviour variables for one organisation.

Literature Review: A number of individual determinants including attitudes/beliefs, norms/subjective norms, self-efficacy, habit, motivation, knowledge, feedback and socio-demographics (see review by Lo et al 2012a) have been used to explore employee environmental behaviour. This paper includes only the individual variable of attitudes but in two ways: attitudes towards environmental behaviour in the workplace and general environmental attitudes. Many studies using attitudes find them to be a key predictor of environmental behaviours (Marans and Lee 1993; Tudor et al 2007; Tudor et al 2008)

although some studies have not found this correlation (Siero et al 1996; et al 2005) with others finding only a moderate to weak correlation (Lo et al 2012a; 2012b).

A number of organisational determinants have also been studied and are those factors that explicitly refer to the organisational context (Lo et al 2012a). These can be either objective, which are independent of individual respondents' perception, or subjective, which are concerned with individuals' perception of (an aspect of) the organisational context.

Organisational focus is one determinant which, it is suggested, has significant influences on behaviour. Tudor et al (2008) found that a centralised organisation focus determined the practices and the levels of attention/resources that were directed toward sustainable waste management which was evidenced in three ways: (1) the impact of organisational focus on beliefs, attitudes and levels of staff motivation, (2) a high degree of apathy coupled with low levels of motivation among staff toward noncore activities, (3) the main aim of managers was to meet their business targets, even if it meant other issues, being placed at a secondary level of importance (such as sustainable waste management). They also noted individual motivation was strongly influenced by the organisational focus. The low motivation and high apathy with regards to environmental waste behaviour appeared to result from the bureaucratic NHS control. In addition, the authors highlighted the importance of organisational structure and in particular facilitation of individual behaviour, decision-making and feedback, up the chain, affecting individual's motivation and behaviour. Scherbaum et al (2008) also note that organisational structures, policies, interventions and characteristics can facilitate or inhibit organisationally desired energy-use behaviours, which is why they must be taken into careful consideration.

A few studies have considered the role of organisational commitment to environmental issues as a determinant of individual employees' behaviour, although the results have been mixed. Lee et al (1995) explored the role of organisational commitment to recycling and found that organisational commitment was moderately predictive of both general office recycling behaviour and office paper source reduction. However, Andersson et al (2005) examined perceived corporate commitment to sustainability and found that it did not predict behaviours related to sustainability support, in the workplace.

Organisational culture (job category, group dynamics and norms) has also been an area noted, as it relates directly to norms within the workplace; for example where waste may be considered acceptable (Smith and O'Sullivan 2012) and may affect attitudes of employees. Tudor et al (2008) discuss the problem of an 'ingrained culture' where new staff adopt routines and strategies of other employees and there is resistance to change.

A number of studies highlight the importance of leadership and support in determining employee environmental behaviour. Smith and O'Sullivan (2012) note elements of formalisation/flexibility, spatial distance from leaders, advisory/staff support and group cohesion as key elements. In their study they found a general lack of support, environmental leadership or access to decision makers. Tudor et al (2008) found that support from managers for the implementation of environmental policies was also limited.

The effect of infrastructure, physical surroundings, proximity and convenience (all of which can be directly affected by the organisation) on recycling has been studied with Lee et al (1995) noting that non-recyclers are more likely than recyclers to perceive recycling as inconvenient. However results have been mixed as to whether this is a successful area for

behaviour change. Both Brothers et al (1994) and Ludwig et al (1998) found that proximity to recycling bins made a significant difference to the amount and quality of recycling. Brothers et al (1994) found that when containers for recycling were closer to individuals, paper recycling increased from 28% to between 85-94%. Lee et al (1995) however found no significant relationship between convenience and level of recycling, even though they do note their study was limited by self-report of the convenience and objective measurements of the placement of recycling bins were not available.

Studies in the area have taken a number of different approaches in terms of their behavioural focus and on measurement of behaviour. Waste management/recycling has been the most popular focus within the employee environmental literature (Ludwig et al 1998; Marans and Lee 1993; Tudor et al 2007; Tudor et al 2008; McDonald 2011) and both general environmental behaviour and specific recycling behaviour is included within this study. Studies have also been split between the study of actual behaviour and that of stated or reported behaviours. Like a number of other studies (Scherbaum et al 2008; McDonald 2011; Smith and O'Sullivan 2012) this study utilised self-reported behaviour.

Methodology: The data used in this study were drawn from a wide-scale quantitative survey of four companies (A to D) by Global Action Plan, a leading UK environmental behaviour change charity. This questionnaire was neither originally designed, nor data were collected, with this specific analysis in mind, which imposes some limitations on the dataset and the possible analyses. The data was also not specifically tailored to either academic research or primarily focused on the issue of organisational factors and their effect on employee environmental behaviour. The measures involved would probably have been designed differently had the research been intended for this specific purpose. However, the data generated is rich and the sample is large ($n_A=460$, $n_B=51$, $n_C=52$, $n_D=241$ - a sample of 804 overall) so an exploration of the issues can certainly be commenced. Therefore, a conservative statistical approach was used and results should be interpreted as exploratory and tentative. Results do however suggest the need for deeper, more tailored research in this area.

Two sets of analyses took place. Firstly, four organisational variables and five behaviour/individual variables (see Table 1 below) were extracted and analysed. Please note that data for the infrastructure variable was not available for organisation D. Secondly, another analysis was carried out for organisation D where an intervention took place and where pre- and post-intervention questionnaires had been collected. This analysis used a reduced sample of 173 ($n=92$ pre and 81 post) which was obtained after the data was cleaned and two comparable groups were obtained (i.e. there were no significant differences in terms of age, gender, race and employment type) The intervention included a heating/cooling campaign and recycling campaign which ran simultaneously across the organisation's buildings and locations. The messages of these campaigns were "Make individual, low energy, adjustments to control your temperature" and "Reduce the amount of paper you use by printing less or more efficiently".

Analysis: Table 1 includes the first correlation analysis of the variables outlined above for all four organisations. Correlations between organisation and individual variables are underlined with those significant at the 0.01 level also highlighted. Interestingly the measure of infrastructure, which included measures of how well the environment is set up to support behaviour and amount of knowledge/support about practices (see Appendix A for

scale detail), correlated significantly with all individual/behaviour measures. This is also reflected in the overall organisational variable, which also includes these measures. The largest correlation can be seen with environmental attitudes. Infrastructure was also correlated significantly with overall behaviour in the workplace (a composite of general and recycling behaviour) and attitudes towards environmental behaviour in the organisation. Surprisingly in comparison with the literature, organisational commitment and incentives did not correlate significantly with individual/behaviour variables.

Table 1: Correlation of Organisational and Individual Variables (Organisations A-D)

	Org commitment	Org incentives/support	Infrastructure	Overall org variable	Attitudes towards environmental behaviour in the workplace	General environmental behaviour in the workplace	Recycling in the workplace	Overall environmental behaviour in the workplace	Environmental attitudes
Org commitment	1	.304**	-.006	.698**	-.033	-.016	.070*	.035	-.069*
Org support/incentives	.304**	1	.144**	.774**	.046	.045	.076*	.075*	.088*
Infrastructure	-.006	.144**	1	.538**	.235**	.311**	.116**	.259**	.358**
Overall org variable	.698**	.774**	.538**	1	.065	.114**	.121**	.144**	.092**
Attitudes towards environmental behaviour in the workplace	-.033	.046	.235**	.065	1	.229**	.125**	.214**	.399**
General environmental behaviour in the workplace	-.016	.045	.311**	.114**	.229**	1	.338**	.805**	.267**
Recycling in the workplace	.070*	.076*	.116**	.121**	.125**	.338**	1	.831**	.201**
Overall environmental behaviour in the workplace	.035	.075*	.259**	.144**	.214**	.805**	.831**	1	.284**
Environmental attitudes	-.069*	.088*	.358**	.092**	.399**	.267**	.201**	.284**	1

** Correlation is significant at the 0.01 level, * Correlation is significant at the 0.05 level.

Table 2: Independent t-tests (organisation D only)

	Pre-intervention		Post-intervention		df	t	p
	M	SD	M	SD			
Org support	3.39	.98	3.690	.78	169	-2.230	.027
Org incentives	2.18	1.05	2.53	.98	171	-2.214	.028
Overall environmental behaviour in the workplace	3.61	1.17	3.14	1.04	162	2.133	.034

The second analysis using independent t-tests showed that there were significant differences between the pre-intervention and the post-intervention responses in terms of overall environmental friendly behaviour at the workplace ($M_{\text{pre-intervention}} = 3.63$ vs. $M_{\text{post-intervention}} = 3.42$; $p < .05$) and in terms of their perceptions of the support they should receive from the

organisation to work in an environmentally friendly way and the need for the organisation D to incentivise/reward this type of behaviour (see Table 2).

Discussion & Conclusions: The analyses have made some tentative steps in better understanding the effects of organisational variables on employee environmental behaviour and also how these can be compared with individual and behaviour measures. Firstly, the data allowed an exploration of the role of organisational commitment. Analysis 1 suggested that organisational commitment was not a key factor in determining employees' behaviour or attitudes. This adds to the mixed results already in the literature (Lee et al 1995; Andersson et al 2005) and suggests the need for a better understanding of organisational commitment and how specifically it affects employee environmental behaviour. While it was not possible to explore both leadership and support elements (which are grouped together in the literature) it was possible to study support alone. In analysis 1 only small (but positive) correlations were found between support (in particular incentives) and individual behaviour and attitudes. In analysis 2 there are clear differences in support and incentives between the post and pre intervention conditions. These are due to the successful intervention, during which the organisation incentivised behaviour (e.g. using competitive table leagues and small food treats), and offered support via members of staff designated as "green liaison officers". The literature suggests the importance of these variables; however these analyses suggest that some of these variables may not be as important as suggested. The final variable which was amenable to study in these analyses was infrastructure. As can be seen in Appendix A the scales used in the infrastructure variable included broad knowledge and perceived ability of individuals to change and choose their behaviour, as well as how much this was set up/supported by the organisation. Analysis 1 showed that this was a key variable supporting some previous literature (Lee, De Young and Marans 1995). However, this variable requires further research and should explore, develop and assess which are key infrastructure variables and which should perhaps be separated into support and self-efficacy variables and the resulting effect on employee behaviour.

In terms of the development of campaigns and interventions organisations should ensure that they first understand the employee perceptions of support and infrastructure (and other organisational variables) within the organisation and where lacking improve support and infrastructure but also use this to develop campaign messages either highlighting support/infrastructure that is already there but not know about or highlighting new support/infrastructure that has been made available.

There are a number of limitations of the paper. Firstly, as noted this data was not collected with these analyses in mind and hence the scales were not developed in an academically rigorous way. Secondly, the measures are subjective and behaviour was self-reported and it would be advantageous in future research to collect actual behavioural data. While all four organisations underwent interventions comparable post intervention data was only available for organisation D and hence this analysis was restricted. Future research should also develop more robust measures of organisational variables and could, for example, explore and use a measure of organisation culture (e.g. Deshpande, Farley and Webster 1993) amongst others. Future research should also explore the possible contribution of age, gender and length of service, as well as making comparisons between organisations which could relate to the site/type of organisation (Tudor, Barr and Gilg, 2008).

Appendix A

Scales used for the Infrastructure Variable in Analysis 1:

I know how to reduce my waste and to recycle within my workplace.

I know how to have meetings by phone/video conferencing.

I am unable to control my offices energy use in the workplace (e.g lighting, heating, office equipment).

I am able to reduce the amount of paper I use when printing/ photocopying.

I am unable to limit the amount of disposable cups I use in the workplace.

I have insufficient means (time/ money/ facilities) to do my work in an environmentally responsible way

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